

REMARKS

Summary

By this Amendment, Claims 1 and 11 have been revised, and accordingly, Claims 1-15 remain pending in the application.

35 U.S.C. ¶103

Claims 1-4 and 11-15 were rejected under 35 U.S.C. ¶103 as being unpatentable over the admitted prior art (APA) in view of Masakuni et al (UP 10-284678), Stearns et al. (US 5895967) and Kirkman (US 6064113), for the reasons stated at pages 2-5 of the Office Action. Applicants respectfully traverse this rejection with respect to the now-pending claims.

In the Office Action, the Examiner states:

“The APA fails to specify the signal line plane being divided into two or more planes including a first plane having only a first power lines and a second plane having only a second power lines. Masakuni et al teach using a substrate having a variety of power/signal/ground routing configurations comprising a signal plane (5c in Fig. 2, 14-18, 1-18) where the signal plane is divided into two planes including a first and second plane (5c-1 and 5c-2 in Fig. 2, 14-18, etc.) located on a first and second portions of the substrate surface... .”

As shown in Fig. 2 of Masakuni, the first and second wirings 5c-1 and 5c-2 referenced by the Examiner are a common ground wiring and a common power supply wiring, respectively. Paragraph [0042]. As shown in the figure, these wirings are formed as striped conductive patterns at opposite edges of the substrate.

In contrast, the present invention is at least partially characterized by the provision of signal line planes which occupy a two-dimensional area of the substrate surface, where a plurality of ball mounts are contained in the two-dimensional area, and where some of the ball mounted are electrical isolated from the signal line plane.

The Examiner's attention is respectfully directed to Fig. 3A of the present application. As shown, a signal line plane 262 occupies a two-dimensional area on a surface of the substrate. Within this two-dimensional area of the signal line plane 262 are a plurality of ball mounts 216. Some of the ball mounts 216 are commonly electrically counted to the plane 262, while others of the ball mounts are electrically isolated from the plane 262. As described at page 10, lines 2-19, of the present specification, the configuration of Fig. 3A is advantageous in that lines for the power signals are combined to facilitate routing of the conductors, and further in that inductance is reduced by the large conductive area of the signal

planes. Contrast this with Masakuni in which multiple, narrow signal patterns must be routed from the striped conductive patterns 5c-1 and 5c-2.

In consideration of the above, Applicants respectfully contend that the cited references, taken individually or in combination, do not teach or suggest at least the following limitations of Claim 1:

“a first plurality of balls respectively mounted within the first plurality of ball mounts, wherein some of the first plurality of balls are electrical connected to the first signal line plane and others of the first plurality of balls are electrically isolated from the first signal line plane;

a second plurality of balls respectively mounted within the second plurality of ball mounts, wherein some of the second plurality of balls are electrical connected to the second signal line plane and others of the second plurality of balls are electrically isolated from the second signal line plane;”

Applicants also respectfully contend that the cited references, taken individually or in combination, do not teach or suggest at least the following limitations of Claim 11:

“a power plane extending over a first two-dimensional area of the second surface of the substrate on one side of the slot, the power plane including power ball mounts, power balls and the power pads;

a ground plane extending over a second two-dimensional area of the second surface of the substrate on one side of the slot, the ground plane including ground ball mounts, ground balls and the ground pads; and

a plurality of signal ball mounts located within and electrically isolated from at least one of the first and second two-dimensional areas of the power plane and the ground plane, respectively;"

Conclusion

No other issues remaining, reconsideration and favorable action upon the elected Claims 1-4 and 11-15 now-pending in the application are requested.

Respectfully submitted,

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